

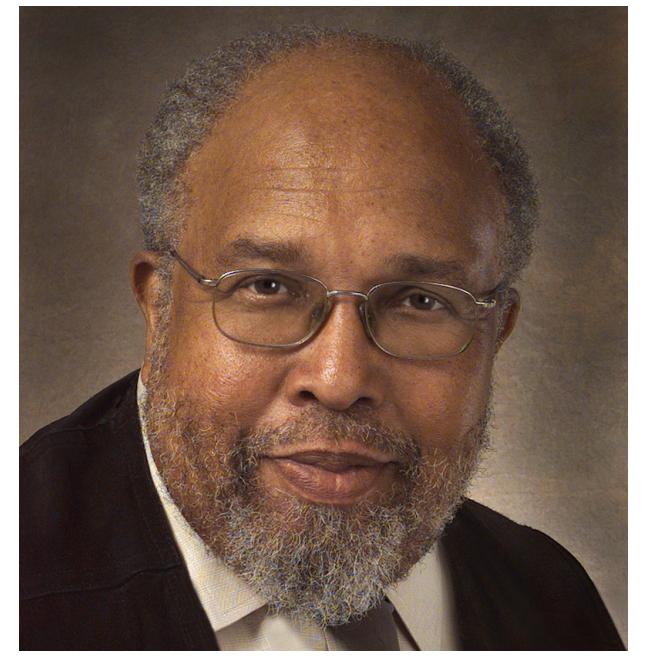
# Searching for Black Women in Mathematics

Natasha Arnold (Cal Poly Pomona), Tianna Couch (Pomona College), Brandon Douglas (Cal Poly Pomona),  
 Tadius Frank (Pomona College), and Christina Marsh (Pomona College)  
 MADDER: Mathematicians of the African Diaspora Database's Ensemble of Researchers

## Abstract

Historically, Black women are underrepresented in the field of mathematics. While the achievements of some Black female mathematicians have been celebrated in popular culture, many of their accomplishments have gone unrecognized. Through teaching, research, collaboration, and mentorship the contributions of Black female mathematicians should be honored and celebrated. This project revisits archives and databases to compile a comprehensive list of Black female Ph.D.s in mathematics through history. This list is part of an ongoing project tracking and documenting the contributions of mathematicians of the African diaspora. Through this project, we hope to highlight the resilience and unique stories of Black women in academia.

## Mathematicians of the African Diaspora (MAD Pages)



Scott W. Williams

The screenshot shows the homepage of the Mathematicians of the African Diaspora website. It features a header with the title "Mathematicians of the African Diaspora" and links to "Frances Sullivan January 8, 1944 - December 14, 2007", "John A. Ewell February 28, 1928 - July 21, 2007", and "CAARMS 14: Conference for African American Researchers in the Mathematical Sciences July 22-27, 2008". Below the header is a navigation menu with sections like "CONTENTS", "The Greatest Black Mathematicians", "Black Research Mathematicians & their Books", "A MODERN HISTORY OF BLACKS IN MATHEMATICS", "THE ANCIENTS in Africa", "Black and Worldly", "WORLD Organizations", "Black Mathematicians & Journals", "Computer Scientists", "NEW Ph.D.s", "Ph.D.s", "FOR OPENINGS", "MODER References", and "ACKNOWLEDGEMENTS". The main content area displays a grid of profiles for various mathematicians, with one profile for Etta Zuber Falconer highlighted.

Williams introduced the site in 1997. There are more than 1,000 pages featuring Biographies and Stories. [He stopped updating them in 2008](#).

## Updated MAD Pages



Don King



Asamoah Nkwanta



John Weaver

The screenshot shows the updated version of the MAD Pages website. It features a header with the title "MATHAD: THE MATHEMATICIANS OF THE AFRICAN DIASPORA" and links to "Recent Events" (listing the 2019 NAM Meeting at Southern University) and "Featured Profiles" (showing four profiles: Morris Akao, Marjorie Lee Browne, Terence Edwards, and Edray Goins). The main content area displays a grid of profiles for various mathematicians, with one profile for Trachette Levon Jackson highlighted.

<https://www.mathad.com/home>

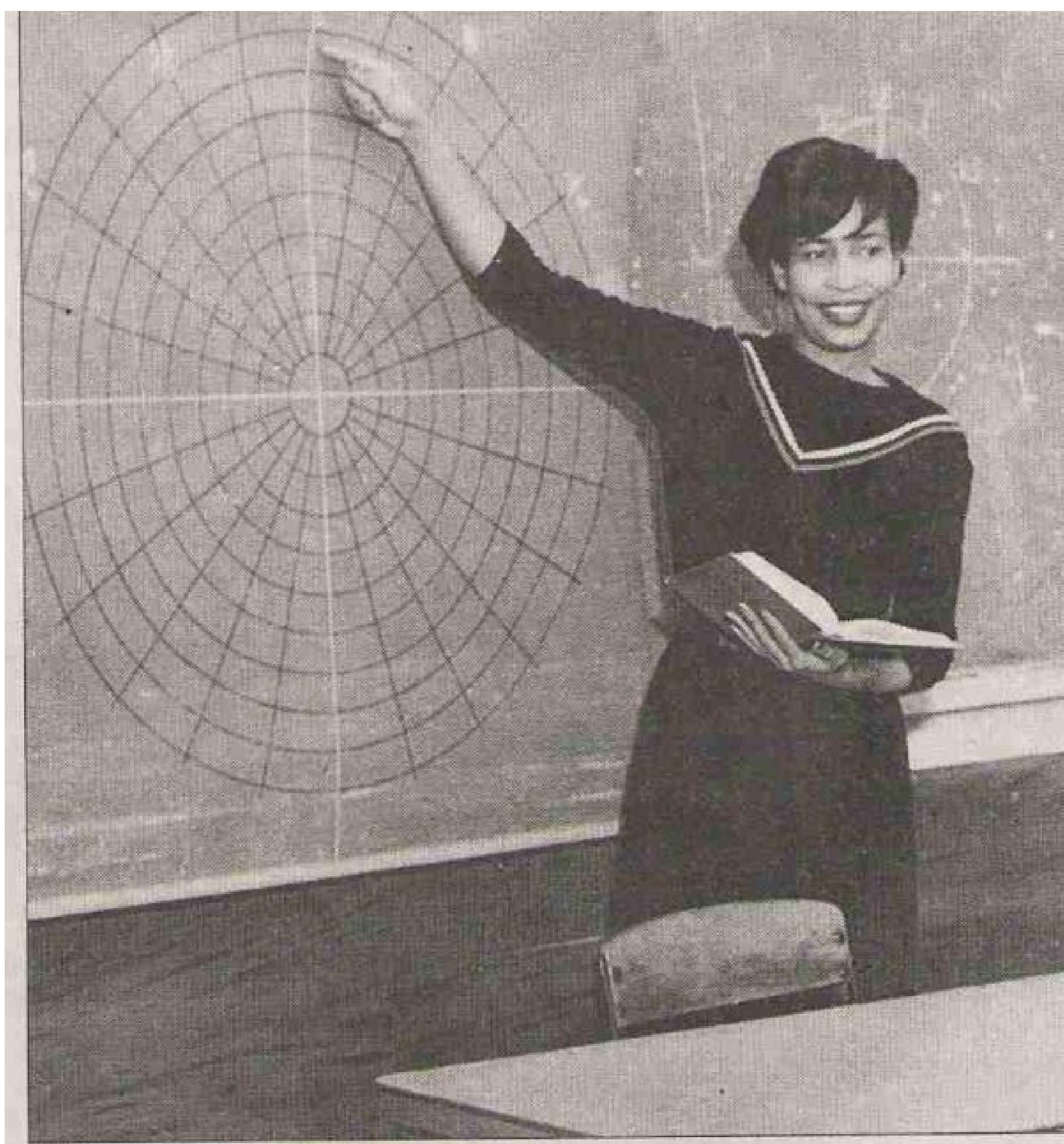
Goins, King, Nkwanta, and Weaver have been working since 2010 to update the Pages. [There are 800 names in the MAD Pages Database](#).

## MAD Database's Ensemble of Researchers (MADDER)

Edray Goins (Pomona College) and Robin Wilson (Cal Poly Pomona) received funding from the Center for Undergraduate Research in Mathematics (CURM) to have students to participate in research assistantships for the academic year.

## Goals

- ① **Researching and Writing Biographies** (2 hours a week)  
Verify information in the biographical narrative, and interview individuals whenever possible.
- ② **Database Quality Control** (1 hour a week)  
Update database information for individuals already profiled in the database, and add new profiles not currently in the database.
- ③ **Weekly Research Meeting** (2 hours a week)  
Students will (a) give progress reports on the profiles updated, (b) exchange with other students the drafts of written biographies, and (c) discuss assignments of names for the coming week.



Etta Zuber Falconer (1933 – 2002)

In 1969 she became the 10th African American woman to earn a Ph.D. in Mathematics (from Emory University) with an Algebra dissertation entitled "Quasi group Identities Invariant under Isotopy."

## Motivation

Because of systemic barriers to education and academia, it was and continues to be incredibly difficult for Black women to enter the STEM fields. The MADDER project aims to search for and document the brilliance of Black women that has been undermined and unrecorded for centuries.

Our list of Black women in Mathematics begins in 1943 with Martha Euphemia Lofton Haynes. She is said to be the first Black woman awarded a Ph.D. in mathematics. While doing this work, we must remain committed to the fact that Black women's involvement in mathematics predates 1943 and the documented history of Black women in mathematics is incomplete. Despite the fragmentary nature of the archives, the contributions of Black female mathematicians provide a dense history of progress and excellence. As STEM fields grow and become increasingly diverse and accepting of marginalized communities, it is important that we say the names of those who paved the way for mathematicians and academics of all backgrounds. We can be certain that all of the women we have documented in our list have faced some form of adversity or injustice in their academic pursuits and beyond. We honor the Black women who were not famous and who did not get movies made about them. We honor the Black women whose names we have not found, and those whose contributions to the field would be ignored or rewritten due to hate and injustice.

From rocket science to resistance, these stories deserve to be told, but first we must find their names.

## Limitations

- We were able to get stories for different women that obtained their PhD in mathematics but their names were often anonymized since they were participants of qualitative research.
- Another limitation was the size of the population. Black women are a marginalized group in mathematical academia, and searching for information about their personal lives and academic journeys required reaching out to current faculty and Black women mathematicians for their stories and help on finding others.
- Not many PhD granting institutions that we contacted kept records on the number of African American women that have earned PhDs from their Mathematics Departments.
- Due to IRB regulations, some of the outreach and mentorship programs that we contacted were not able to share their data on the Black women PhDs that they have supported.

## Black Women with PhDs in Math (Incomplete)

Name	Year of PhD	PhD Granting Institution
Martha Euphemia Lofton Haynes	1943	Catholic University
Marjorie Lee Browne	1949	University of Michigan
Evelyn Boyd Granville	1949	Yale University
Gloria Conyers Hewitt	1962	Univ. of Washington
Argelia Velez-Rodriguez	1960	University of Havana
Sadie Gasawat	1961	-
Georgia Caldwell Smith	1961	University of Pittsburgh
Thyra Frazier Svager	1965	Ohio State University
Vivienne Malone-Mayes	1966	University of Texas
Eleanor Dawley Jones	1966	Syracuse University
Shirley Mathis McBay	1966	University of Georgia
Geraldine Darden	1967	Syracuse University
Annie Garraway	1967	University of California at Berkeley
(Mary) Lovenia DeConge Watson	1968	St. Louis University
Ann Marie Meyers Pelot	1968	Georgetown University
Etta Zuber Falconer	1969	Emory University
Gloria Ford Gilmer	-	Marquette University
Dolores Richard Spikes	1971	Louisiana State University
Rada Higgins McCreadie	1974	Ohio State University
Elayne Arrington-Idowu	1974	University of Cincinnati
Evelyn Patterson Scott	1974	Wayne State University
Fern Y. Hunt	1978	New York University
Karolyn Anne Morgan	1978	-
Fannie Ruth Gee	1979	University of Pittsburgh
Emma R. Fenceroy	1979	-
Frances Sullivan	1980	City University of New York
Suzanne Craig	1980	University of Southern California
Sylvia Bozeman	1980	Emory University

## Methods

While working as a group under our advisor Dr. Robin Wilson we were tasked with creating a detailed list about African American women who earned their PhD from 1943 to the current year. Our goal was to create a current list of Black female Mathematicians who earned their PhDs. We began this process by searching through journals, newsletters, and articles on the internet, reaching out to other colleges and universities for information, and cross-referencing other available lists to ours. Some of the available resources we used were Wikipedia, the Mathematicians of the African Diaspora Website [5], the NAM Newsletter Archives, a journal called "An Unlikely Cohort Disrupting the Stereotypes about Mathematicians and their Careers", and doing literature searches for Black Women in Mathematics using JSTOR and Google Scholar.

We attempted to identify the year each person was born, where they were born, the college they went to that awarded them their PhD, the year they earned their degree, the college they did their undergraduate degree and the year they finished, any research or publications they worked on, mentors, what they worked after graduation, when they died, and anything else that was interesting about the person. We met weekly during the semester to discuss our findings.



Trachette Levon Jackson

received her Ph.D. from the University of Washington in 1998, and studies the mathematics of angiogenesis. She was selected as a fellow of the Association for Women in Mathematics (AWM) in the inaugural class in 2017.

## Goal

To find the complete list of Black women who have earned Ph.D.s in mathematics.

## MADDER Research Subgroups

- Subgroup #1: **Black Women in Mathematics**  
Natasha Arnold, Tianna Couch, Brandon Douglas, Tadius Frank, and Christina Marsh; led by Robin Wilson  
[Who are the first African American Women to earn PhDs in Math?](#)
- Subgroup #2: **Black PhDs in Mathematics from 2000 - Present**  
Dante Christian, Virgil Munyemana, and Erin Sewell; led by Edray Goins  
[Who are the recent African Americans to receive PhDs in the Math?](#)
- Subgroup #3: **Numbers of Black PhDs in Mathematics**  
Daniel Agbeo, Kamil English, Reia Li, and Devon Woodfine; led by Goins  
[What are the numbers of African Americans to receive PhDs in Math?](#)

## Future Work

- We hope to continue to work with institutions to uncover Black women whose PhD work has gone historically undocumented and unnoticed to work closer to compiling a complete list.
- In the future, we hope to be able to add these names to the MAD pages and create biographies to document these women's accomplishments.
- We hope that the current data we have collected can be utilized to enrich other databases, to better educational opportunities for Black women, and to diversify academia and representation in math education.
- We hope to involve more current Black women mathematicians in the data collection process for recommendations to other Black math faculty and spread awareness about the project.
- We hope to extend the MAD pages to a social media platform to target younger audiences to empower and inform young Black students and faculty in STEM.

## References

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- [2] Patricia C. Kenschaft. *Black Women in Mathematics in the United States*. <https://doi.org/10.2307/2320508>
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- [4] List of African American Mathematicians. [https://en.wikipedia.org/wiki/List\\_of\\_African-American\\_mathematicians](https://en.wikipedia.org/wiki/List_of_African-American_mathematicians)
- [5] Mathematicians of the African Diaspora (MAD Pages). <http://www.math.buffalo.edu/mad/>
- [6] Mathematics Genealogy Project. <https://genealogy.math.ndsu.nodak.edu>
- [7] National Center for Science and Engineering Statistics (NCSES). <https://ncsesdata.nsf.gov/home>

## Acknowledgements

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